

CLAIMS

1. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties, said steel sheet containing, in mass,

5 C: 0.0050% or less,
Si: 0.50% or less,
Mn: 0.005 to 1.0%,
P: $10 \times (B - 11/14 \times N)$ to 0.10%,
S: 0.080% or less,
10 Al: 0.050% or less,
N: 0.0005 to 0.020%,
B: $0.60 \times N$ to 0.020%,
O: 0.002 to 0.0800%, and

and the balance being Fe and unavoidable impurities, and
15 the steel sheet further containing simple or compound nitrides having a diameter of 0.02 to 0.50 μm which contain B or Al, and having the average diameter of 0.080 μm or larger, and the proportion of the number of the nitrides of 0.050 μm or smaller in diameter to the total
20 number of said nitrides being 10% or less.

2. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties, said steel sheet containing, in mass,

25 C: 0.0025% or less,
Si: 0.050% or less,
Mn: 0.10 to 0.50%,
P: $10 \times (B - 11/14 \times N)$ to 0.030%,
S: 0.030% or less,
Al: 0.010% or less,
30 N: 0.0035 to 0.0060%,
B: $0.60 \times N$ to 0.0060%,
O: 0.005 to 0.0450%, and

and the balance being Fe and unavoidable impurities, and
the steel sheet further containing simple or compound
35 nitrides having a diameter of 0.02 to 0.50 μm which contain B or Al, and having the average diameter of 0.080

µm or larger, and the proportion of the number of the nitrides of 0.050 µm or smaller in diameter to the total number of said nitrides being 10% or less.

5 3. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties, said steel sheet containing, in mass,

C: 0.0025% or less,

Si: 0.050% or less,

Mn: 0.10 to 0.50%,

10 P: 10x(B-11/14xN) to 0.030%,

S: 0.030% or less,

Al: 0.010% or less,

N: 0.0005 to 0.0033%,

B: 0.60xN to 0.90xN%,

15 O: 0.005 to 0.0450%, and

and the balance being Fe and unavoidable impurities, and the steel sheet further containing simple or compound nitrides having a diameter of 0.02 to 0.50 µm which contain B or Al, and having the average diameter of 0.080
20 µm or larger, and the proportion of the number of the nitrides of 0.050 µm or smaller in diameter to the total number of said nitrides being 10% or less.

4. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties according to any one of claims 1 to 3, wherein the steel sheet further containing one or more of Nb, V,
5 Ti, Ni, Cr, Se, As, Ta, W, Mo and Sn at 0.030 mass % or less in total.

5. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties according to any one of claims 1 to 4, said
10 steel sheet satisfying the following expression:

(the amount of N existing as BN)/(the amount of N existing as AlN) \geq 10.0

6. (Amended) A steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties according to any one of claims 1 to 5, said
15 steel sheet satisfying the following expression:

(the amount of N existing as BN)/(the amount of N existing as AlN) \geq 0.50

7. (Amended) A method for producing a steel sheet
20 for vitreous enameling excellent in workability, aging properties and enameling properties and enameling properties characterized by:

retaining a slab containing the components according to any one of claims 1 to 4 in the temperature range from 900 to 1,100°C (Retained Temperature Range 1)
25 for 300 minutes or longer before commencing hot rolling;

thereafter retaining it in a temperature range not less than 50°C higher than said retained temperature (Retained Temperature 2) for 10 to 30
30 minutes;

then cooling it to a temperature range not less than 50°C lower than said retained temperature (Retained Temperature 3) at a cooling rate of 2°C/sec. or less;

35 retaining it in said retained Temperature 3 for 10 minutes or longer; and thereafter commencing hot

rolling.

8. (Amended) A method for producing a steel sheet for vitreous enameling excellent in workability, aging properties and enameling properties and enameling
5 properties according to claim 7, wherein hot-rolling is controlled under the condition of the time period from the time when the coiling of a hot-rolled steel sheet terminates at a temperature of 700 to 750°C in a hot-rolling process to the time when the temperature of said
10 steel sheet reaches 550°C or lower for 20 minutes or longer.

9. (Amended) A method for producing a steel sheet
for vitreous enameling excellent in workability, aging
properties and enameling properties and enameling
properties according to claim 7 or 8, wherein the hot-
5 rolled steel sheet is retained in the temperature range
from 900 to 1,200°C for 2 minutes or longer with the
temperature of said steel sheet not lowered to 900°C or
lower when the reduction ratio reaches 50% or more after
commencing hot-rolling, and thereafter hot-rolling is
10 commenced again.